*Read the following passage about collectible game, then answer the open response question.*

**OPEN-RESPONSE READING ITEM**

**Classifying Triangles**

There are two different ways to classify a triangle: by sides or by angles. When classifying by sides, a triangle can fall into one of three different categories. The first category is equilateral. An equilateral triangle has three sides that are equal in length, or congruent sides. The second category is called isosceles. An isosceles triangle is a triangle that has at least two congruent sides. In an isosceles triangle, the base angles (those angles opposite the congruent sides) are also equal. The third category that triangles may be classified in is scalene. A scalene triangle has three different sides of varying lengths.

Triangles can also be classified by the measure of their angles. There are four categories for classify triangles by angles. Before one can fully understand these categories, they must understand the Triangle Angle Sum Theorem. This theorem states that the three angles of a triangle must always add to equal 180 degrees. The first category is equianglular. For example, an equiangular triangle has three congruent angles. In an equiangular triangle, all angles measure 60 degrees (because 60 degrees times 3 angles equals 180 degrees). An equiangular triangle is always equilateral too. The second category for classifying triangles by angles is acute. In an acute triangle, all three angles must be acute

which means that their measures must be less than 90 degrees. An equiangular triangle is also an acute triangle. The third category is obtuse. In an obtuse triangle, one angle must be an obtuse angle. This means that one angle must measure greater than 90 degrees. In order for the three angles to add up to 180 degrees, only one of the angles can measure greater than 90 degrees. The fourth, and final, category is right triangles. Right triangles must have one angle that is considered a right angle. That means that the angle must measure exactly 90 degrees. If one angle is 90 degrees then the remaining angles must be acute in order to add up to the 180 degree total.

When classifying triangles, one must assign two names. One name is based on the sides and one name is based on the angles. Triangles can be acute scalene, right isosceles, obtuse scalene, or any other combination. The only combination that is always certain is that if a triangle is equilateral, it must also be equiangular.

Multiple Choice

1. How many ways are there to classify a triangle?
2. 1
3. 2
4. 3
5. 4
6. An equilateral triangle has three sides that are \_\_\_\_\_\_\_\_\_ in length.
7. Proportional
8. Equal
9. Opposite
10. Divided
11. What are base angles?
12. Angles opposite the congruent sides
13. Angles on the bottom
14. Complementary Angles
15. Supplementary Angles
16. The triangle sum theorem states that the three angles of a triangle must always add to \_\_\_\_\_.
17. 45
18. 90
19. 100
20. 180

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. In an equilateral triangle, all angles measure \_\_\_\_ degrees.
2. 45
3. 60
4. 90
5. 180
6. In an obtuse triangle, \_\_\_\_ angle can measure greater than 90 degrees.
7. 1
8. 2
9. 3
10. 4
11. When classifying triangles, you must assign how many names?
12. 1
13. 2
14. 3
15. 4
16. The only combination that is always certain is \_\_\_\_\_\_\_\_\_\_.
17. Scalene, right
18. Equilateral, Equiangular
19. Isosceles, Obtuse
20. Equilateral, Obtuse